



# COMMON LICHENS

OF

## CYPRESS HILLS INTERPROVINCIAL PARK Saskatchewan, Canada



## A FIELD GUIDE

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Photography © Bernard de Vries

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## Introduction

This field guide was written as an introduction to the fascinating world of lichens, many of you might have seen as colourful splashes on rock or pendent from tree branches, but did not know what they were.

To most of us, our attention and admiration is drawn to the many colourful plants Cypress Hills Park has in plenty; but lichens remain somewhat of a mystery; lacking flowers, leaves and roots, or any form of visible fruits, although the vivid colour of some attracts our attention. Lichen are able to survive in what appears to us as unusual places, such as dry needle groundcover, tree bark, bare branches or twigs, and open rock (conglomerates). Although some branches and twigs upon which lichen grow are dead, these, were not killed by lichens. Lichens dislike competition of other organisms as these deprive them of needed sunlight and moisture to obtain nutrients. Once competition is removed by natural means, lichens will rapidly colonize such bare areas.

Although this guide was written for use in Cypress Hills Park, it is also useful in the boreal forest, as many lichens discussed in the guide can be found there as well. The reason being that certain vegetation elements in the Park belong to the Temperate, as well as the Western Montane Geographic Distribution Pattern. (Brodo et al. 2001), occurring in all ecoregions and ecozones of Saskatchewan.

The 14 lichen species are alphabetically arranged by genus, with the authority for each. Included are known common name(s) and synonym(s). There are notes on where the species is found within the park; the occurrence; geographic distribution; type of growth form; a detailed description; and illustrations with a colour photo and insets to bring out important details of certain species, which will help in identifying lichens in the field.

The comment section gives information on similar related species; uses by First Nation People; plant lore and plant deviation (Johnson et al.1995). The text is mostly non-technical with English wording. Technical equivalents are listed in the glossary.

It is hoped that this guide will be of help to the naturalist and anyone interested to learn more about lichens and their importance in the various ecosystems of this park.

## Growth Forms

Lichens show many growth forms. These are recognized as Foliose (leaf-like), Fruticose (bushy or upright with many stems, pendent or mat-forming), and Crustose (forming a crust over the surface they grow on). Tree bark and rocks often show this form. Another growth form is Squamulose (with many scale-like lobes), often seen by *Cladonia* (the Clad lichens) species.

## Reproduction

Since lichens do not have flowers and produce seeds, how then do they reproduce? This is not an easy question to answer, because lichens form a relationship between two or more components, a fungus and a green, or blue-green algae (*cyanobacteria*), and sexual reproduction becomes somewhat complicated. The algae as well as the fungus can reproduce individually, but to form a recognizable lichen, they must come together, that is to say, that a viable fungal spore must unite with the appropriate algal spore to initiate a new lichen, providing the right substrata and habitat exists.

If we carefully examine the upper surface of a lichen, we might discover three important structures for sexual or vegetative reproduction. The largest of them would be the fruiting body in which the viable spores are formed. Two smaller, but nonetheless important, are the vegetative powdery or hard-bodied peg-like structures. Each of these are miniature lichens, having the necessary components (algae and fungus) and able to start an independent life upon a suitable substratum. A much simpler way of propagation is by fragmentation, whereby parts of a lichen containing both the algae and fungus, finds a new location and starts growing.

## Colour

Lichens show an amazing variety of colour, from nearly white to shades of gray or brown, to brilliant red, orange or yellow. The most vivid colours usually to be seen on rocks or tree bark in open, sunny locations. Lichen colour therefore is thought to be of importance in regulating temperature, since certain colours scatter or reflect sunrays protecting the sensitive algae layer, and keeping the lichen body cooler. (Brodo et al. 2001). The majority of lichens in the boreal forest where ultraviolet rays are not much of a problem, are more subdued in colour.

## Physiology

Lichens are a very special kind of plant; composed of a physical association of two or more dissimilar organisms: a fungus and either a green or blue-green (cyanobacterium) alga. The interesting part is that either one of them by itself could not survive under the harsh conditions some lichens grow in. This association is also beneficial to the lichen itself, in that the algae are the photosynthetic component; able to utilize sunlight to manufacture carbohydrates. The fungus lacking a green pigmentation is unable to do so; instead gives shelter to these delicate algal cells by surrounding them with fungal strands, and partly utilizing the algal cell to obtain some of the carbohydrates for its own metabolism. The fungal part is in fact somewhat parasitic. The fungal strands also give structure to the lichen body, and it is interesting to know that while the algae have their own scientific names, the name given to the lichen (body) is that of the fungus.

Lichens can survive in extremes of temperatures, by going dormant, entering a dry state. Upon receiving moisture, they will resume their normal processes. Since lichens do not have true roots nor a vascular system, they are able to absorb moisture directly into their body, utilizing the dissolved minerals. However, should a toxic element be present in sufficient quantities or absorbed over a period of time, the algal cells will be affected and eventually the delicate balance between the lichen components will break down. This results in the death of the lichen. Lichens can thus play an important role in assessing ecosystem health. For this reason lichen species such as the Pelt or dog lichens (*Peltigera*) or Beard lichens (*Usnea*) which have a large surface area, are recognized as valuable low cost environmental monitors.

## What Lichen Grow On

Every living organism needs a place to attach itself to, and lichens are no exception to this; they can be found on a variety of surfaces, from organic to inorganic. Some lichen species are more particular to one kind of surface, while others are more tolerant. Three main characteristics of substrata must be met: texture, porosity, and chemistry.

## Lichen Studies

Previous scientific lichen studies in the park were made by de Vries and Bird (1998), and the Forest Ecosystem Classification Survey (2000). Further ongoing lichen surveys are done by de Vries. However, no informative lichen field guide exists for Cypress Hills Interprovincial Park, and this guide is the first of its kind.

To study lichens in the field, you need a small 10x magnifier, a small water bottle (to wet-dry lichens to observe possible colour changes) a note book and pens/pencils, a small plastic ruler, your lichen guide and any other recommended field books.

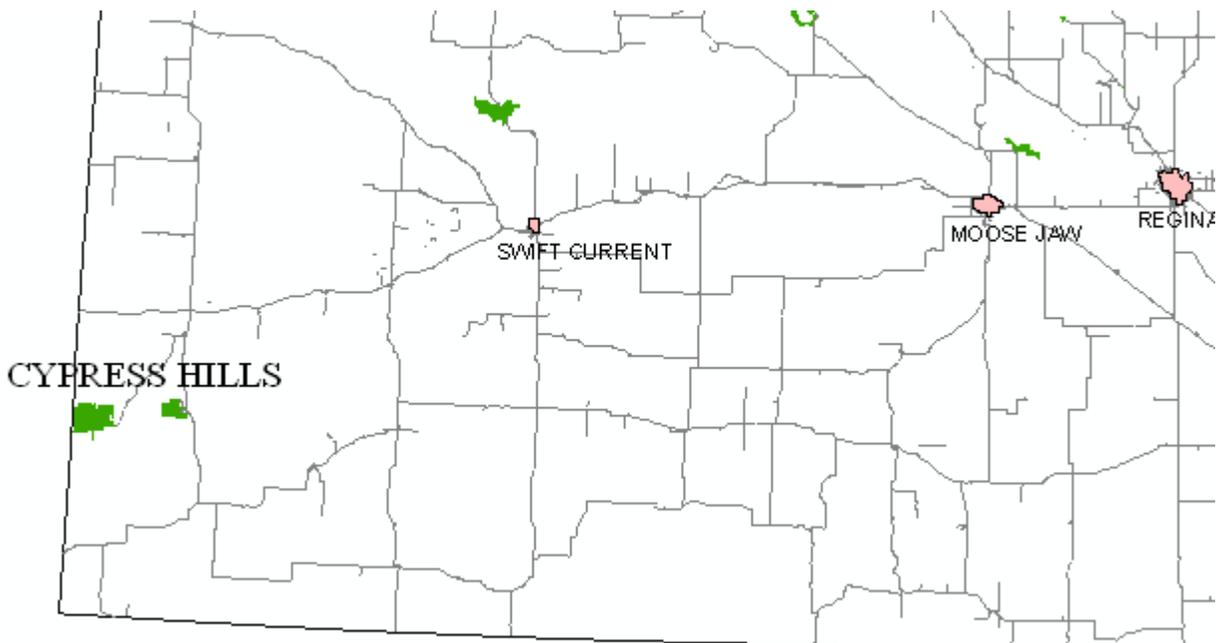
## Protection

All plants in a Provincial Park are protected including lichens, and can only be collected for scientific study under a special Scientific Collection Permit, granted to professional lichenologists or academics. These researchers must submit duplicates and an annotated list of species collected to the Park's Naturalist.

Lichens are notoriously slow growers, and an entire population can be destroyed by careless collecting, and it is best to leave collecting of lichens to specialists who have the proper facilities for storing and studying samples.

Several uncommon, including some rare lichens, occur in the park. One of them *Letharia vulpina* (Wolf lichen) does in the park at higher altitudes, and should not be collected.

## Location of Cypress Hills Interprovincial Park



# ***Bryoria simplicior***

(Vainio) brodo & D. Hawksw.

## **Spangled horsehair, simple horsehair**

Synonym(s): *Alectoria simplicior* (Vainio)  
Lynge

**Where Found:** In marginal Lodgepole Pine forest on bark. Also on White Spruce.

**Occurrence:** Scattered, but not uncommon.

**Geographic Distribution:** Across the Lodgepole Pine forests in the park. Circumpolar.

**Growth Form:** Pendent

**Description:** When you notice small, rather dense or slightly long brownish black to black tufts, with dull or slightly shiny branches, and many tiny round to oval white to greenish-white clusters of powdery vegetative structures speckled with greenish-black flecks on the bark of Lodgepole Pine, you discovered this lichen. Other characteristics are that the branch tips are thinner than the main branches, straight or slightly curved, and at times attached to the substrate, as well as at the base. Branches form acute angles; powdery vegetative structures are sharply delimited, round to oval, becoming crater-like upon shedding of these vegetative structures. There are no minute spines mixed with these powdery structures, and fruiting bodies are absent.



**Comments:** This lichen is often intermixed with other horsehair lichens, especially *Bryoria fuscescens* (Speckled horsehair). However the latter has dark medium brown branches which are even in width and the powdery structures appear as tiny white flecks. *Bryoria furcelata* (Burned horsehair-lichen) can also be confused with Spangled horsehair, but has short pointy side branches and spiny bodies with a hard outer covering mixed with the powdery vegetative structures. These lichens are often entangled with *Usnea* species (Beard lichens). The tiny hair-like branches of *Bryoria* resemble horsehair in texture, hence the common name. The specific name *fuscescens* is based on the Latin ‘*fuscus*’ meaning dark brown, possibly referring to the brown colour of the lichen, which tends to intensify in sunny locations.

# ***Cetraria ericetorum***

Opiz

## **Iceland moss, Iceland lichen**

Synonym(s): None

**Where Found:** On the ground in marginal open Lodgepole Pine forest.

**Occurrence:** Quite common.

**Geographic Distribution:** Throughout the park, and northern boreal forests. Circumpolar boreal and arctic-alpine.

**Growth Form:** Erect foliose.

**Description:** This small, often tufted lichen has narrow, smooth, dark olive brown to reddish or dark brown shiny lobes with partly back turned tips. Spine-like projections and long white lines occurring along the margins, which are often fused when edges touch, forming a channel. The lower surface is paler than the upper surface. Fruiting bodies with incurved margins and smooth, reddish brown disks are seldom formed at the tips of slightly enlarged lobes.



**Comments:** *Cetraria ericetorum* is related to *Cetraria islandica* (Icelandmoss), but the former has thin white lines along the narrow lobe margins, while *Cetraria islandica* has scattered dotted white spots on the wider lobe surface. Species of *Cetraria ericetorum* which show conspicuous ridges and pits on the upper surface, are the subspecies: *reticulata* (Räsänen) Kärnefelt .

# *Cladina mitis*

(Sandst.) Hustich

## Yellow reindeer lichen, green reindeer lichen

Synonym(s) *Cladina arbuscula* (Wallr.)  
Hale & W.L. Culb. ssp. *mitis* (Sandst.)  
Burgaz, *Cladonia arbuscula* ssp. *mitis*  
(Sandst.) Ross, *Cladonia mitis* Sandst.

**Where Found:** Open marginal Lodgepole  
Pine forest on sandy soil or on needle cover.

**Occurrence:** Quite common.

**Geographic Distribution:** Throughout the  
Park, and wide spread across the boreal  
forest. Arctic to temperate circumpolar.

**Growth Form:** Shrub-like.

**Description:** This upright yellowish-green  
lichen has mainly open axils, showing an  
intricate branching from a main stem; it is  
not fork-branching from the base as seen in  
other Reindeer lichens. Branches are  
hollow, dull, lacking an outer surface,  
appearing cottony, or have minute warts,  
especially upon aging. The open crown has  
numerous divergent branches in groups of  
3's or rarely in 4's with sterile branches  
ending in 2-5 points, which are more or less  
curved into one direction, or showing  
unequal spreading. The small, brown  
fruiting bodies are singly or in flat-topped  
clusters at branch-tips.



**Comments:** *Cladina arbuscula* (Greater  
reindeer lichen) is similar and closely related  
to yellow reindeer lichen, and regarded by  
some lichenologists as a subspecies, with  
which it tends to intergrade throughout its  
range. However, there are some differences  
between the two species, greater reindeer  
lichen is copiously and coarsely branched  
from the base, and the tips curved into one  
direction. Yellow reindeer lichen is often  
associated with *Cladina rangiferina* (Gray  
reindeer lichen). Reindeer lichens are an  
important winter nutrient for large  
ungulates, especially in northern boreal  
forests.

# ***Evernia mesomorpha***

Nyl

## **Boreal oakmoss, spruce moss**

Synonym(s): None

**Where Found:** On trunks of Lodgepole Pine, and hardwoods in sunny locations.

**Occurrence:** Frequent.

**Geographic Distribution:** Throughout the park. Circumpolar boreal and temperate.

**Growth Form:** Pendent or in shrubby tufts.

**Description:** This yellowish green semi pendent or tufted lichen, has irregularly thick, abundantly divided, angular, and longitudinally wrinkled to partly flattened, soft and pliable branches. Abundant coarse masses of yellowish to grayish vegetative structures occur on the angular ridges. No fruiting bodies are present. The inner fungal layer is white and loose.



**Comments:** Boreal oakmoss is often confused with *Usnea* species (Beard lichen) with which it often grows, because of similarity in colour. However, the latter has a solid central fungal cord, which is lacking in boreal oak moss. Another lichen boreal oak moss can be mistaken for is *Ramalina dilacerata* (Punctured *ramalina*), which although similar in habit and colour, has flattened branches, and does not have a central cord nor vegetative structures. The genus name *Evernia* apparently alludes to the Greek 'growing well', but could also reflect on its abundance in the boreal forest. Oakmoss lichens are notoriously slow growers, a few mm yearly, and are more tolerant to air pollution than beard lichens.

# *Hypogymnia physodes*

(L.) Nyl.

## Monk's-hood lichen, hooded tube lichen

Synonym(s): *Parmelia physodes* (L.) Ach.

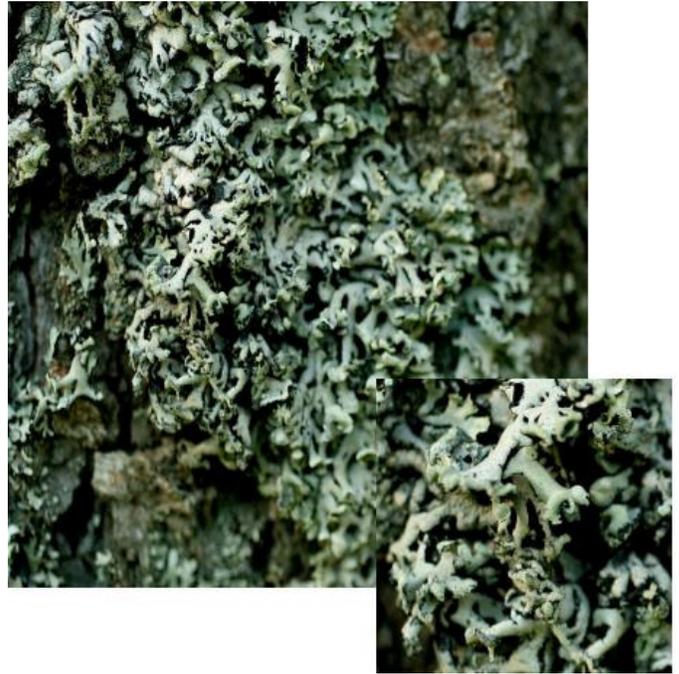
**Where Found:** On Lodgepole Pine, various deciduous trees or tall shrubs. Uncommon on soil, moss or rocks.

**Occurrence:** Frequent.

**Geographic Distribution:** Widespread across the Park, and occasionally reaching into the northern Aspen Parkland Ecoregion in the Prairie Ecozone.

**Growth Form:** Leaf-like.

**Description:** Monk's-hood lichen is variable in form, usually forming flattened or somewhat erect closely attached, gray to blue-gray, long or short smooth lobes which are often irregular branched at the tips. Lobe tips are hollow, usually inflated, and hood-like, producing pale green powdery vegetative granules on the inside. The lower surface is wrinkled, black, lacking attachment outgrowths. The fungal layer is white, and fruiting bodies are rare.



**Comments:** This common tree lichen could be confused with *Hypogymnia tubulosa* (Powder-headed tube lichen). However, this lichen lacks the upturned hood-like lobe tips, characteristic for Monk's-hood lichen. The latter is also quite tolerant to sulphur dioxide and can be found in close proximity to relatively polluted areas, and could be considered being an atmospheric indicator. It has been reported as a food or medicine and brown dye for woollens. Powder-headed tube lichen has yet to be reported for the Park.

# ***Melanelia exasperatula***

(Nyl.) Essl.

## **Lustrous brown, lustrous camouflage lichen, wart lichen**

Synonym(s): *Parmelia exasperatula* Nyl.

**Where Found:** In open Lodgepole Pine forests on bark of coniferous as well as deciduous trees.

**Occurrence:** Quite common.

**Geographic Distribution:** Widespread throughout the Park and boreal forest. Rarely found in the northern aspen parkland ecoregion. Circumpolar.

**Growth Form:** Leaf-like.

**Description:** Lustrous brown has closely attached, often oily shiny and centrally dull, olive-green to olive-brown, smooth, flat to slightly wrinkled lobes, which are sometimes raised at the tips, or reflected at the margins. No powdery or granular vegetative structures are present; instead small bumps on the upper surface enlarge into inflated, hollow, shiny, club shaped or barrel-shaped structures, with simple or occasionally forked tips, which are miniature vegetative structures. The lower side is tan to dark brown, having many attachment structures. Fruiting bodies are very uncommon.



**Comments:** The species name *exasperatula* refers to the Latin *exasperatus* roughly meaning ‘roughened with many prickles’, possible referring to the many club-shaped structures on its upper surface. It takes a keen eye to spot this unique lichen with its many club-shaped or barrel-like structures, as its colour blends well with the dark bark upon which it growth.

# ***Parmelia sulcata***

Taylor

## **Hammered shield lichen, powdered shield, wax paper lichen**

Synonym(s): None

**Where Found** Mainly in open marginal Lodgepole Pine forest on bark or as forest litter. Also found on White Spruce and various deciduous trees or large shrubs.

**Occurrence:** Frequent.

**Geographic Distribution** Throughout the Centre and West Blocks of the Park, and across the boreal forest, extending south into the Aspen Parkland Ecoregion in the Prairie Ecozone. Circumpolar.

**Growth Form:** Leaf-like.

**Description:** Hammered shield lichen has blue or ashy gray, lobes, becoming almost brown in open locations, but becoming a light green when moistened. The lobes are elongated with entire or notched margins, with a network of sharp raised ridges and depressions with numerous small white dots caused by breaks in the upper surface, showing white fungal strands breaking through on the surface. Round or elongate powdery vegetative structures can often be seen along these ridges or on lobe margins. The underside is black, with numerous simple attachment structures, which become branched upon maturity. Fruiting bodies are rare, but occasionally produced directly or on short stalks upon the upper surface; margins entire, or occasionally with small powdery vegetative structures. The disks are flat and dull brown.



**Comments:** Hammered shield lichen often growth in association with other lichens, and as a pioneer species in suburban parks on a variety of trees. The lichen yields a deep brown to dark tan or sometimes a golden or rusty brown hue to dying wool. Hummingbirds often use this lichen as nesting material for camouflage. The species name *sulcata* comes from the Latin *sulcatus* 'to furrow' pertaining to the furrowed network on the lichen's upper surface. *Parmelia saxatilis* (Rock lichen) can be confused with hammered shield lichen, as it is similar coloured and found in the same habitat. However, rock lichen as the name implies, grows on rock, rarely on tree bark or wood, and has tiny club-shaped outgrowth on the upper surface. The specific name *saxatilis* refers to the Latin *saxum* 'a rock' referring to the species being an inhabitant of rocks or among rocks.

# ***Peltigera preatextata***

(Flörke ex Sommerf.) Zopf

## **Scale dog lichen, rough dog lichen, born-again pelt**

Synonym(s): *Peltigera canina* var. *rufescens* f. *innovans* (Körber) J.W. Thomson, *Peltigera canina* f. *innovans* (Körber) J.W. Thomson

**Where Found:** In open, marginal Lodgepole Pine forest on needle cover, decaying logs, or sheltered road shoulders among mosses.

**Occurrence:** Frequent, but scattered

**Geographic:** Throughout the Park. Circumpolar.

**Growth Form:** Leaf-like.

**Description:** The upper surface of scale dog-lichen has smooth, dull gray, greenish brown to brown, more or less wavy lobes which tend to become crisp upon aging, and with a thin wooly covering on the lobe tips. Minute small flat regeneration bodies can develop along stress cracks and margins. The pale undersurface has a network of slightly raised light brown to brown veins, becoming darker towards the center, and with simple rather long thread-like outgrowth. Fruiting bodies are uncommon.



**Comments:** Scale dog-lichen can resemble other dog-lichens, especially *Peltigera canina* (Dog-lichen). However, in scale dog-lichen the more discrete veins are less raised; never joining at the base as in dog-lichen, which lacks stress cracks and regeneration bodies.

# ***Peltigera rufescens***

(Weiss) Humb.

## **Field dog lichen, felt pelt**

Synonym(s): *Peltigera canina* (L.) Willd.  
variety *rufescens* (Weis.) Mudd.

**Where Found:** On needle cover in marginal Lodgepole Pine Forest, or along roadside shoulders on dry gravelly soil.

**Occurrence:** Frequent, but scattered.

**Geographic:** Throughout the Park in Lodgepole Pine forests. The species is also common in the boreal forest. Circumpolar.

**Growth Form:** Leaf-like.

**Description:** This lichen has medium sized gray to brown crisped lobes, with strongly upturned margins, usually covered with a heavy appressed covering of fine white hairs on the upper surface. The underside has distinct raised veins with pale margins, but tending to become darker inwards. The attachment structures are thick tufts of fungal strands, coalesce towards the centre into an almost continuous mat, especially noticeable along the veins. The common dark-red brown fruiting bodies are saddle-shaped on upright lobes.



**Comments:** Although Field dog-lichen resembles *Peltigera canina* (Dog lichen - photo insert), the relationship between these is somewhat controversial. Dog lichen has large, undulating, lobes, usually turned down marginally, and the upper surface is conspicuously covered with fine fuzzy hairs, especially near the tips. However, the differences between the two species could also be environmentally; *Peltigera canina* can be found on sandy soil in open woodlands and forests, while *Peltigera rufescens* occurs mostly on exposed and drier locations, especially along roadsides.

# ***Physcia aipolia***

(Ehrh. ex Humb.) Fűrnr.

## **Hoary rosette lichen, grey-eyed rosette**

Synonym(s): None

**Where Found:** On trunks and large branches of Lodgepole Pine, White Spruce, deciduous trees especially Aspen, Balsam Poplar, and various tall shrubs.

**Occurrence:** Frequent

**Geographic:** Throughout the Center Block and West Block. Also in the boreal forest and Aspen Parkland Ecoregion in the Prairie Ecozone. Circumpolar.

**Growth Form:** Leaf-like.

**Description:** Hoary rosette lichen forms pale to dark gray closely appressed rosettes, with flat narrow radiating, lobes, which are conspicuously white spotted on the upper surface, with somewhat saucer-shaped or upturned tips. Vegetative structures are absent, but dark brown fruiting bodies with frosted disks are common towards the centre. The lower surface is tan with many pale attachment bodies.



**Comments:** *Physcia stellaris* (Star rosette) also a tree-dwelling species, can be confused with hoary rosette lichen. Both have the same colour and similar growth form, but star rosette lacks such small white spots, and its lobes are mostly flat. The species too, tends to grow higher on tree branches, while hoary rosette lichens usually is found on bark nearer tree bases. The specific name *stellaris* is from the Latin *stella* 'star' referring to the general roundish body shape.

## *Stereocaulon tomentosum*

Fr.

### Woolly coral, woolly foam, eyed foam

Synonym(s): *Stereocaulon tomentosum* Fr.  
var. *alpestre* Flotow

**Where Found:** In marginal, open  
Lodgepole Pine forest on needle cover.

**Occurrence:** Infrequent; more or less  
scattered.

**Geographic:** Throughout Lodgepole Pine  
forests in the Park. Wide spread in the  
boreal forest. Circumpolar, boreal-  
montane.

**Growth Form:** Erect shrub-like.

**Description:** This conspicuously ashy to  
silvery-blue gray, lichen has many common  
names referring to its 'coral-like' form and  
woolly coating. The many erect, often  
clumped stalks have many distinct re-curved  
solid branches, with an upper and lower  
surface. The upper surface has tiny gray,  
flattened and overlapping minute scale-like  
lobed outgrowth, with shallow toothed  
margins. Small gall-like growth containing  
the blue-green alga Nostoc, are imbedded in  
these scale-like lobes; the lower surface is  
coated with clumps of thick woolly hairs.  
Numerous, small fruiting bodies with  
rounded, red-brown discs and pale margins  
occur on lateral branches.



**Comments:** Woolly coral can be confused  
with *Stereocaulon paschale* (Common  
coral). However, there are characteristic  
differences between these species. In woolly  
coral the fruiting bodies are numerous,  
small, laterally appressed, convex, and the  
minute scale-like lobes are attached to the  
stems, which have a clearly defined upper  
and lower surface; the latter with a hair-like  
mat. Common coral has a thinner or nearly  
absent woolly covering; small scale-like  
clusters of granular protuberances, which are  
somewhat elongated or almost coral-like,  
but seldom becoming finger-like lobed.  
Small, dark brown, fibrous, irregular, gall-  
like outgrowth are noticeable on the  
branches. The few fruiting bodies are  
terminal, larger and flatter. Both species  
share the same geographic distribution.  
*Stereocaulon* comes from the Greek *stereos*  
'hard or firm', and *kaulos* 'a stem', referring  
to the solid stems of the species. The  
species name *tomentosum* refers to the Latin  
*tomentum* 'stuffing of hair or wool',  
pertaining to the woolly underside.

# ***Usnea substerilis***

Mot.

## **Embossed beard**

Synonym(s): *Usnea stuppea* (Räsänen)

Mot.

**Where Found:** In open marginal Lodgepole Pine forest and occasionally on deciduous trees.

**Occurrence:** Frequent.

**Geographic:** Throughout the Centre Block as well as the West Block. Also found across the boreal forest. Circumpolar boreal.

**Growth Form:** Pendent.

**Description:** Embossed beard is a rather small, usually 25mm long and wide, greenish or straw-yellow coloured, erect, pendent species. The main stem has many rather tufted non-inflated branches, distinctly covered with cylindrical bumps, which are lacking on the branches, and has a narrow basal dark zone. Branches are smooth, appearing at right angles to the main stem, bearing copious small, raised vegetative structures, containing a very fine whitish powdery substance in localized masses, and often mixed with easily detached peg-like structures. Fruiting bodies are absent.



**Comments:** This lichen can be confused with *Usnea lapponica* (Powdered beard lichen) and *Usnea subfloridana* (Nit beard lichen). Both are similar in colour and growth form. However powdered beard lichen has branches densely covered with small bumps, and powdered vegetative structures, which at times are deeply excavate, encircling the branches, or reaching into the inner fungal layer and forming eroding rings; peg-like bodies are absent. Nit beard lichen has clusters of peg-like structures, which are not always obvious. All beard lichens have usnic-acid, which has widespread application as an antibiotic, e.g. *streptomycin*, used for treating tuberculosis. Among these beard lichens, one can find *Bryoria simplicior* (Spangled horsehair) or *Bryoria fuscescens* (Pale-footed horsehair). These lichens are darker than the beard lichens, and both are short pendent. Pale-footed horsehair has small, white, powdery vegetative structures and occasionally spiny side branches, while the powdery bodies of spangled horsehair are greenish-white with occasional black flecks, and branches slightly curved at the tips. Both species are found infrequently, a 10x magnifying lens, is needed, to distinguish one species from the other.

# ***Vulpicida pinastri***

(Scop.) J.E. Mattsson & M.J. Lai

## **Powdered sunshine lichen**

Synonym(s): *Cetraria pinastri* (Scop.) S. Gray, *Tuckermannopsis pinastri* (Scop.) Hale.

**Where Found:** On Lodgepole Pine or deciduous tree bark. Also on old wood and occasionally on tall shrubs or rocks.

**Occurrence:** Frequent, but scattered.

**Geographic:** Throughout the Park and boreal forest. Circumpolar boreal and temperate.

**Growth Form:** Leaf-like.

**Description:** Powdered sunshine lichen is a showy forest species with pale greenish-yellow to yellow loosely adherent or slightly upright small lobes, forming rosettes. The lobes are rounded, overlapping, with ruffled or divided margins, dissolving into fine powdery masses of greenish-yellow or bright lemon-yellow vegetative bodies. Fruiting bodies are rare and mostly absent. The lower surface is pale yellow to almost white, with sparse to abundant pale to dark brown attachment structures.



**Comments:** This showy lichen can be mistaken for *Letharia vulpina* (Wolf lichen) which is a montane species, only found in the Park. However, wolf lichen is brilliant yellow, not rosette forming, and more or less tufted-pendent, with coarse granular vegetative structures which become gradually hard-bodied, found on the angular and ridged branches. This species and powdered sunshine lichen can be found in the same habitat. The yellow colour of powdered sunshine lichen comes from two poisonous substances, *pinastric* and *vulpinic* acids, thought to be a repellent to grazing insects or invertebrates. In Europe this lichen was used to kill wolves and foxes and indeed the generic name *vulpicida* comes from the Latin *vulpes* 'Fox' and *cadaere* 'to kill'.

# *Xanthoria elegans*

(Link) Th. Fr.

## Elegant sunburst lichen, elegant orange lichen, rock orange lichen

Synonym(s): *Caloplaca elegans* (Link) Th. Fr.

**Where Found:** On conglomerate rock and other rock types in open areas. Periodically found on wood or bone.

**Occurrence:** Frequent locally.

**Geographic:** A cosmopolitan species. Circumpolar. Arctic to temperate.

**Growth Form:** Leaf-like.

**Description:** Elegant sunburst lichen is a showy species, forming almost circular patches, with radiating, irregular branched, pale yellowish orange to dark red-orange lobes. The lobes are closely attached, rounded, and narrow, lacking vegetative structures. The lower protective surface is white without attachment bodies. Fruiting bodies are sessile or slightly stalked, yellow to orange, with flat or convex discs the same colour as the lichen body.



**Comments:** Elegant sunburst lichen can resemble *Caloplaca saxicola* (Smooth firedot lichen) and *Caloplaca trachyphylla* (Desert firedot lichen), in colour and growth habit. However elegant sunburst lichen has a lower protective surface, and can be lifted intact from its substratum, while the *Caloplaca* species lack such surface, and can not be lifted without damage to it. Elegant sunburst lichen has been used to date surfaces by measuring its growth rate, which is extremely slow; averaging a few mm per year. Elegant sunburst lichen can often be found among the equally slow growing afore mentioned firedot lichens, which also can be found on the conglomerate outcrop on the West Block of the Park.

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Note: Those marked \* are recommended easy to use field books for the beginner.

## **GLOSSARY**

**A group marked by common characteristics** genus

**A small scale-like lobe** squamule

**A felt-like covering of fine hairs** tomentum

**A network of sharp ridges and shallow depressions** reticulate

**An oval gaping slit** fissural

**As tufts, pendent, shrub-like, erect, or with unbranched stems** fruticose

**Attachment structures** rhizines

**Basis evolutionary unit of an organism** species

**Broken up into small angular bodies** areaolate

**Cell division** meiosis

**Central stout attachment structure** holdfast

**Circular** orbicular

**Closely attached** adnate

**Cottony, downy or woolly** tomentose

**Cylindrical bumps as seen in *Usnea*** papillae

**Flattened and closely attached** appressed

**Flat-topped clusters** corymb

**Forming crusts** crustose

**Fruiting bodies** apothecia

**Fruiting Stem** podetia

**Gaping split, often resembling an oval or fusiform shape** fissural

**Growing on bark** corticolous

**Growing on soil** terricolous

**Growing on trees** arboreal

**Growing on rock** saxicolous

**Growing on old wood** lignicolous

**Hair-like** filamentous

**Hair-like attachment bodies** rhizines

**Hair-like fungal strands** hyphae

**Indicators of environmental conditions** bioindicators

**Inner fungal strand or layer** medulla

**Leaf-like** foliose

**Lichen body** thallus

**Living on the surface of a plant** epiphytic

**Minute flattened bodies** platelets

**Minute spines** spinules

**Minute scale-like lobes found in** *Stereocaulon* phyllocladia

**Narrow tapering at both ends** fusiform

**Photosynthetic component of a lichen** photobiont

**Pointed** acute

**Relationship between a fungus and algal cells** symbiosis

**Sac-like structures containing spores** asci

**Small lateral growth on cup margins** proliferation

**Small powdery or granular vegetative bodies** soredia

**Small scale-like body** squamule

**Small scale-like lobes** squamulose

**Small gall-like growth containing blue-green algal cells found in** *Stereocaulon* cephalodia

**Spotted or blotched with short or long white lines** maculate

**The surface upon which a lichen grows** substrate

**Thumb-shaped or peg-like bodies with a hard outer covering** isidia

**Tiny hair-like** filamentous

**Turned back** reflexed

**Unification of a fertile fungal spore with an appropriate algal cell** lichenization

**Upper and lower protective surface** cortex

**Vegetative lichen body** thallus

**Vegetative peg-like outgrowth** isidia

**Vegetative powdery or granular structures or bodiess** soredia

**Vegetative structures for propagation** propagules

**With a covering of fine hairs** tomentum

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### **Lichen Skills Ratings – how many did you identify?**

**1-5** Fair

**6-10** Good

**10-14** Excellent - You are becoming a lichen expert

